

CLAIMSWhat is claimed is:

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1. A separator sheet handling assembly for sorting a stack of separator sheets into different locations depending on their characteristics, said separator sheet handling assembly comprising:

    a lifting assembly adapted to receive a pallet having the stack of separator sheets piled thereon;

    a feed assembly adapted to consecutively engage a separator sheet

10    positioned at the top of the stack of separator sheets;

    a test assembly for monitoring the separator sheets received from the feed assembly;

    a first storage assembly for receiving designated separator sheets; and

    a second storage assembly for receiving the remaining separator sheets.

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2. The separator sheet handling assembly of claim 1 further comprising an alignment assembly that aligns the separator sheets received from the feed assembly into a predetermined position for delivery into the test assembly.

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3. The separator sheet handling assembly of claim 2, wherein the alignment assembly includes vertical guides positioned on at least one side of the sheet handling assembly such that the guides laterally maneuver each separator sheet before the separator sheet enters the test assembly.

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4. The separator sheet handling assembly of claim 1 further comprising at least one additional storage assembly for receiving some of the separator sheets from the test assembly.

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5. The separator sheet handling assembly of claim 1, wherein the lifting assembly includes a lifting frame for indexing the pallet containing the stack of separator sheets upward to a position where the feed assembly removes the separator sheet positioned on the top of the stack of separator sheets.

6. The separator sheet handling assembly of claim 5, wherein the lifting assembly includes a support structure and a drive system mounted to the support structure, said drive system being adapted to index the lifting frame upward at designated intervals.

5 7. The separator sheet handling assembly of claim 5, wherein the lifting assembly includes squaring fences positioned around the stack of separator sheets to square the separator sheets before they are delivered through the feed assembly.

10 8. The separator sheet handling assembly of claim 1, wherein the lifting assembly includes an air chamber positioned near the top of the stack of separator sheets for moving air through the lift assembly to facilitate removing only the top separator sheet instead of multiple sheets.

15 9. The separator sheet handling assembly of claim 1, wherein the feed assembly includes a first drive roller.

20 10. The separator sheet handling assembly of claim 9 wherein the feed assembly includes a second drive roller and the first drive roller drives a first plurality of endless belts and the second drive roller drives a second plurality of endless belts such that the separator sheets are feed between the first and second plurality of belts.

25 11. The separator sheet handling assembly of claim 9, wherein the feed assembly moves to engage the separator sheet positioned on the top of the stack of separator sheets and positions the separator sheet between the first and second surfaces of the first and second plurality of belts.

12. The separator sheet handling assembly of claim 1, wherein a portion of the feed assembly is pivotally connected to a support structure on the separator sheet handling assembly.

30 13. The separator sheet assembly of claim 12, wherein the portion of the feed assembly is movable relative to the support structure.

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14. The separator sheet handling assembly of claim 1, wherein the feed assembly includes at least one vacuum fitting for engaging the separator sheet positioned on the top of the stack of separator sheets.

5 15. The separator sheet handling assembly of claim 14, wherein the feed assembly includes a positioning drive for moving the vacuum fittings relative to the lift assembly.

10 16. The separator sheet handling assembly of claim 15, wherein the positioning drive moves the vacuum fittings horizontally relative to the lift assembly.

15 17. The separator sheet handling assembly of claim 16, wherein the feed assembly includes at least one air cylinder for vertically adjusting the vacuum fittings relative to lift assembly.

20 18. The separator sheet handling assembly of claim 15, wherein the positioning drive is connected to a chain that moves in an endless pattern, a portion of the chain being connected to a first bracket such that the first bracket moves along the path of the chain, the first bracket being pivotally connected to one end of a support arm such that the maneuvering of the first bracket by the positioning drive causes movement of the support arm, an opposite end of the support arm being pivotally connected to a second bracket that is connected to a support structure that secures the vacuum fittings such that the pivotal connection between the opposing ends of the support arm and the first and second brackets causes nonlinear motion of the chain to be translated to linear motion of the vacuum 25 fittings.

30 19. The separator sheet handling assembly of claim 1, wherein the second storage assembly which receives the remaining separator sheets is a receptacle positioned adjacent to a frame of the separator sheet handling assembly such that the receptacle receives sheets which are delivered off an end of the frame.

20. The separator sheet handling assembly of claim 1, wherein the test assembly monitors the cleanliness of the separator sheets.

21. The separator sheet handling assembly of claim 1, wherein the test assembly monitors the structural integrity of the separator sheets.

22. The separator sheet handling assembly of claim 1, wherein the first storage assembly includes a directing guide that is maneuverable between a first position that allows the separator sheet to bypass the directing guide and a second position where the separator sheet enters the directing guide.

23. The separator sheet handling assembly of claim 22, wherein the directing guide includes an upper bracket and a lower bracket and the separator sheet enters the directing guide between the lower bracket and the upper bracket when the directing guide is in the second position.

24. The separator sheet handling assembly of claim 22, wherein the first storage assembly includes a lifting frame that is adapted to receive the separator sheets passing through the directing guide.

25. The separator sheet handling assembly of claim 22, wherein the first storage assembly includes a support structure and a drive system mounted on the support structure, the drive system indexing the lifting frame downward as the separator sheets are delivered onto a pallet positioned on the lifting frame.

26. The separator sheet handling assembly of claim 1, wherein the second storage assembly includes a receiving guide positioned to accept the separator sheets that do not enter the first storage assembly.

27. The separator sheet handling assembly of claim 26, wherein the receiving guide includes an upper bracket and a lower bracket and the separator sheet enters the receiving guide between the lower bracket and the upper bracket.

28. The separator sheet handling assembly of claim 26, wherein the second storage assembly includes a lifting frame that is adapted to receive the receive the separator sheets passing through the receiving guide.

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29. The separator sheet handling assembly of claim 28, wherein the second storage assembly includes a support structure and drive system mounted on the support structure, the drive system indexing the lifting frame downward as the separator sheets are delivered onto a pallet positioned on the lifting frame.

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30. The separator sheet handling assembly of claim 1, further comprising a top frame remover assembly for removing a top frame positioned on top of the stack of separator sheets.

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31. The separator sheet handling assembly of claim 30, wherein the top frame remover assembly includes a pair of guided horizontal rails and a gripper assembly that grasps the top frame, the gripper assembly moves along the pair of guided horizontal rails until the gripper assembly is positioned above a collection bin where the gripper assembly releases the top frame allowing the top frame to fall into the collection bin.

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32. The separator sheet handling assembly of claim 1, wherein the first storage assembly includes squaring fences positioned around the stack of separator sheets to square the separator sheets after they are delivered to the first storage assembly.

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33. A method for sorting separator sheets that are used in stacking products in multiple horizontal layers onto a pallet, the method comprising:

providing a pallet containing a stack of separator sheets;

5 removing a separator sheet positioned on top of the stack of separator sheets;

testing the separator sheet for a particular characteristic;

delivering the separator sheet to a first storage assembly if the separator sheet has the particular characteristic; and

10 delivering the separator sheet to a second storage assembly if the separator sheet does not have the particular characteristic.

34. The method of sorting separator sheets as claimed in claim 33 further comprising aligning the separator sheet before testing the separator sheet.

15 35. The method of sorting separator sheets as claimed in claim 33 further comprising:

testing the separator sheet for an additional characteristic;

delivering the separator sheet to a third storage assembly if the separator

20 sheet has the particular characteristic and the additional characteristic.

36. The method of sorting separator sheets as claimed in claim 33 further comprising removing a top frame from the stack of separator sheets.

25 37. The method of sorting separator sheets as claimed in claim 33 further comprising transporting the top frame to a collection bin.

30 38. The method of sorting separator sheets as claimed in claim 33 further comprising squaring the separator sheets after they are delivered to the first storage assembly.

39. The method of sorting separator sheets as claimed in claim 33 further comprising squaring the separator sheets before they are delivered through the feed assembly.

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40. The method of sorting separator sheets as claimed in claim 33 further comprising forcing a stream of air through the lift assembly near the top of the stack of separator sheets to facilitate removing only the top separator sheet instead of multiple sheets.

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